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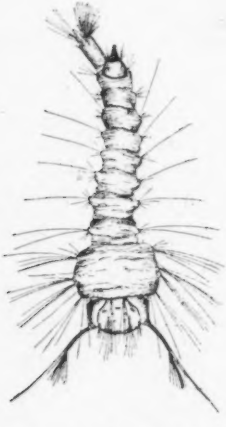

Larva of Culex perturbans as described by Dr. John B. Smith.

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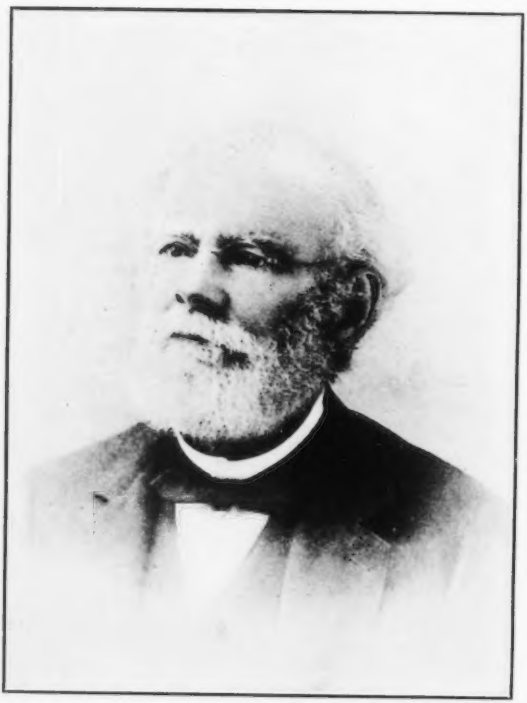

WILLIAM H. EDWARDS.

ENTOMOLOGICAL NEWS

AND

PROCEEDINGS OF THE ENTOMOLOGICAL SECTION

ACADEMY OF NATURAL SCIENCES, PHILADELPHIA.

VOL. XX. MAY, 1909. No. 5.

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William H. Edwards.

(Plate IX.)

This distinguished naturalist died at his home in Coalburgh, West Virginia, on April 4th in his 88th year. He was born in Hunter, Greene County, New York, on March 15, 1822, and was the son of William W. and Helen Ann Mann Edwards. Having been graduated from Williams' College in the Class of 1842, he was admitted to the New York Bar in 1847. One year previous to this he made a voyage up the Amazon River to collect objects of natural history. In 1851 he married Catherine Colt Tappan. He was the author of "A Voyage up the Amazon" (1847); Shaksper not Shakespeare (1900) and compiled a genealogy of the Edwards' family in 1903. His home was at Coalburgh, West Virginia.

The monument to Wm. H. Edwards will be the three volumes he published "The Butterflies of North America," commenced in 1868 and completed in 1897. This work is one of the greatest ever published on the subject, and it has been the source of authoritative information on American diurnal Lepidoptera as a whole for nearly half a century. The author's contributions to our knowledge of life histories marks an epoch in Lepidoptera, and are of very great importance from a scientific standpoint.

Mr. Edwards says in the first volume: "It is a matter of regret that, in so few instances, I shall be able to say anything of the larvae. Even among our old and common species, the larvae are but little more known than in the days of Abbot, seventy years ago." In the preface to the second volume, dated 1884, he says: "All this is changed, and today it can be said that the preparatory stages of North American butterflies as a whole are better known than are those of Europe." This was made possible by an important fact made known by Mr. Edwards. He further says: "In 1870 I discovered an infallible way to obtain eggs from the female of any species of butterfly, namely, by confining her with the growing food-plant. If the eggs mature they will be laid."

He was a careful and painstaking naturalist and his descriptions of species are admirable, and he described many new and interesting one in addition to making known so many life histories. These books are also mines of information on the habits of these insects, as observations on such matters were sent to the author from every part of the United States and Canada. The illustrations were drawn on stone by Mrs. Mary Peart who had no superior in this line of work. His other contributions nearly all appeared in the Proceedings and Transactions American Entomological Society, Canadian Entomologist, or in Papilio, and were always replete with new facts and information.

By far the greater part, if not all, of the species described by Mr. Edwards will stand. He has been criticised for describing too many species of *Argynnis*, but in view of the fact of the great difficulties presented by these butterflies he was probably justified in so doing. He contended that after he described a species its true status would eventually be made out. Mr. Edwards was unquestionably the greatest Lepidopterist this country has produced, and his great work on American butterflies is and always will be a classic one. His work on life histories has never been surpassed, and when we think that all these valuable contributions to science were carried out during the spare time of an otherwise busy man, they are all the more admirable. He published in all about two hundred papers.

A new species of Dolichopsyllus—a genus of the Siphonaptera.

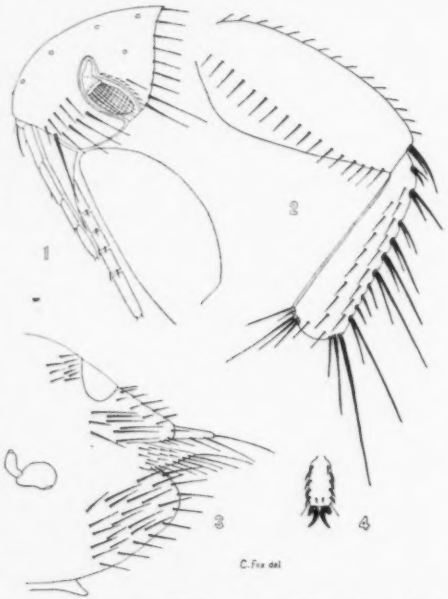
By Passed Assistant Surgeon CARROL FOX, P.H. and M.H.S., San Francisco, Cal.

Dolichopsyllus blnei spec. nov.

Three female specimens collected in November, 1908, from the weasel *Putorius xanthogenys*. No male specimens were obtained. Mr. Rothschild has kindly looked at this flea and pronounced it probably a new species of the genus *Dolichopsyllus*.

Female.—Head evenly and abruptly rounded. Frontal notch distinct. Gena ending posteriorly in an obtuse point. Maxilla triangular. Eye absent. Maxillary palpi reach to about middle of anterior coxa; length of joints, 9, 9, 6, 7½. Labial palpi reach almost to apex of anterior coxa. Five jointed, including undivided basal portion. Lower genal row consists of five bristles, the outermost one the longest and the second the smallest. Five bristles in the upper genal row. About eighteen bristles on hind margin of head, of which the two at the lower posterior angle are the largest. One small bristle on the occiput back of the middle of the antennal groove. Numerous fine hairs along the posterior margin of the antennal groove. Antennal groove extends to one-third of top of head. It is narrow, with somewhat thickened edges. A few fine hairs on first joint of antenna, while on the second joint there are about eight hairs longer than the third joint. Just in front of the insertion of the maxillary palpus there are two bristles. The pronotum contains a row of about fourteen bristles, the lowest of which is much the largest and posteriorly a ctenidium of about twenty or twenty-two spines. The mesonotum has three rows of bristles, an anterior of about twenty-four, a posterior of about sixteen small, with a middle row of about sixteen large bristles. The metanotum contains a posterior row of about sixteen large bristles and an anterior row of about twenty smaller ones. The pleura of the mesothorax contains numerous stout bristles. The episternum of the metathorax contains three large and two small bristles, the sternum three bristles, and the epimerum about sixteen or eighteen, more or less regularly disposed in three rows. The abdominal tergites have each two rows of bristles, the first tergite about sixteen in the posterior row and about the same number in the anterior row. The other tergites have in the posterior row about twenty-four large and in the anterior row about twenty smaller bristles. There is a small tooth on each side of the metathorax and the first and second abdominal tergites. There are three antipygidial bristles on each side. The sternites from the third to seventh have two rows of bristles, a posterior of about sixteen large and an anterior of from eight to ten smaller. On the second sternite there are ven-

trally four or five small bristles, while higher up there is a patch of about twelve. The fore coxa contains numerous bristles. The fore femur has on its inner surface two bristles, while its outer surface contains about twenty fine bristles. The mid femur contains a row of bristles on its outer and inner surfaces, the outer row containing about twelve and the inner row about 8 or 10. The hind femur contains a row of about seventeen bristles on its outer surface, and a row of about the same number on its inner surface. The legs are very bristly. The posterior tibia contains on its posterior border seven groups of spines in pairs, and an apical group consisting of three spines, while between the sixth and seventh paired groups there are three single spines. The outer surface contains two rows of about 8 or 9 bristles each. The longest of the apical bristles of the second hind tarsal joints reaches to the fifth. There are five lateral spines on the last tarsal joints of all the legs, the first pair being slightly dislocated towards the median line. There are also on all these joints a pair of subapical bristles and hairs.



1. Head of female; 2. Hind femur and tibia; 3. Genitalia of female; 4. Fifth tarsal article of hind leg.

Modified Segments.—The end of the abdomen is very bristly. The eighth tergite contains above the sensory plate about ten small bristles, while laterally below the sensory plate there is a group of about eight stout bristles. Below this there is a patch of thirty bristles, some of which are on the apical margin. The stylet is long, narrow, much slenderer at the tip than at the base. At the tip there is one long, slender bristle and two more, a large and a small, come from its under margin. The substylar flap has on its tip and margin numerous long slender bristles.

Length 4.12 mm. Color, very dark brown.

Notes and Descriptions of Wasps of Genus Tachytes.

By S. A. Rohwer, Boulder, Colorado.

Before proceeding I wish to thank Rev. G. Birkmann of Fedor, Texas; Mr. C. T. Brues of the Public Museum of Milwaukee, and Prof. C. P. Gillette of the Colorado Agricultural College for supplying most of the material upon which this paper is founded. Unless otherwise stated, the types of the new species described herein are in the author's collection.

In my work on this genus I have found the color of the pubescence on the pygidium of the female to be constant and of service in separating species. The species of Boreal North America may be grouped as follows: (the females of *spatulatus* Fox, *parvus* Fox, *exornatus* Fox and *basirufus* Roh. are unknown):

Silvery—Section 1.	Bronzy—Section 1.	Golden—Section 1.
validus Cress.	*mandibularis* Cress.	*calcaratus* Fox.
harpax Patt.	*fulviventris* Cress.	*calcaraliformis* Roh.
breviventris Cress.	*crassus* Patt.	*praedator* Roh.
	pepticus Say.	*dubitatus* Roh.
	propinquus Roh.	*columbiae* Fox.
Section 2.	Section 2.	Section 2.
mergus Fox.	*aurulentus* Fabr.	*rufofasciatus* Cress.
	contractus Fox (?)	*obductus* Fox.
	distinctus Sm.	*birkmanni* Roh.
	sericatus Cress.	
	abdominalis Say.	
	obscurus Cress.	

Tachytes basirufus n. sp.

♂.—Length 11 mm.; length of anterior wing 9 mm. Anterior margin of the clypeus broadly produced in the middle, with a small side tooth; the process slightly emarginate in the middle; surface of clypeus rather coarsely punctured. Vertex finely closely punctured; the impressed line distinct, but not strong. Space between the eyes at the top a little less than the length of antennal joints 3+4. Antennal joints 3 and 4 of equal length, somewhat narrowed towards the base; apical antennal joints simple. Dorsulum punctured like the vertex. Scutellum a little more sparsely punctured than the dorsulum; not impressed. Metanotum granular, middle line not strong; fovea at apical middle distinct, transversed by a small carina. Posterior face of metathorax finely, transversly striated; middle line distinct. Venation normal. Fore coxae and femora

simple. Tibiae and tarsi rather strongly spined; first joint of hind tarsi equal to 2 + 3; first joint of middle tarsi about equal to 2 + 3 + 4. Abdomen finely, closely punctured; ventral segments beyond the third with larger, sparser punctures; emargination of the last ventral plate broad round.

Black; palpi, three apical joints of tarsi rufous; tegulae pale testaceous; eyes (dry) green; two basal segments of the abdomen clear red. Wings hyaline, iridescent; venation ferruginous. Face, clypeus, thorax, legs beneath, abdomen (more strongly so towards the apex) with silvery pubescence. Pygidium with pubescence yellowish. Abdomen beneath with some long reddish hairs.

Hab.—Livermore, Larimer Co., Colo., alt. 6000 ft., July 3, 1900. Type in the collection of Colorado Agric. College.*

This species is quite distinct. It belongs to Fox's Section 1 and runs to *T. pepticus* Say, from which it differs in the color of the abdomen, the yellow hair of the pygidium, the different emargination of the eight ventral abdominal segments.

Tachytes propinquus n. sp.

T. crassus Patt., Roh., ENT. NEWS, May, 1908, p. 224, in part.

♀.—Length 16 mm.; length of anterior wing 11 mm. Robust. Anterior margin of the clypeus in the middle produced into a rather narrow process which is slightly emarginate; three distinct lateral teeth; clypeus not at all carinated, closely punctured, except on the anterior margin. Front and vertex finely closely punctured; an indistinct furrow from anterior ocellus to near base of antennae; ocellar area parted by a very fine furrow; middle femora of the vertex very faint. Distance between the eyes at the top equal to the ledgth of antennal joints 2 + 3, perhaps a little greater. Third antennal joint a little longer than the vertex; scutellum not impressed. Metathorax, except anterior part of the metapleurae which is shining and smooth, finely granular; a distinct rather wide furrow from base of metanotum to lower part of posterior face; this furrow does not broaden noticeably anywhere. Metathoracic spiracles about three times as long as wide, rounded at the ends. Second and third cubital cells about equal width on the radial nervure. Tibiae and tarsi rather strongly spinose. Longest spur of hind tibiae about equal to the length of the first joint of hind tarsi. First joint of hind tarsi a little shorter than the length of 2 + 3. Abdomen broad at base, tapering to an more or less acute apex; dorsally finely closely punctured; ventrally more shining, the first two segments closely punctured, the remaining strongly, closely punctured at apex, smooth and shining at the base. Pygidium rather more acute than usual, very slightly contracted apically.

* Since the above was written I have taken three males of this species at Boulder, Colo., Aug. 1 and 4, 1903. The eyes in life are dark green.

Black; mouth part, mandibles, tegulae, apex of femora and legs below rufo-ferruginous. Wings yellowish hyaline; venation ferruginous. Face, clypeus, thorax (more especially the pectus) with fulvous hair and pubescence. Dorsal abdominal segments along the apical margins of segments 1-4 with silvery pubescence. Base of first abdominal segment with long gray hairs. Tibiae and tarsi with golden hair. Pygidium with black and reddish bronze colored hair. Venter with a few long bristle-like reddish hairs.

Hab.—Boulder, Colorado, August 26, 1906 (S. A. Rohwer). Eyes in life lemon-yellow. A ♂, Van Cortlandt Park, N. Y., July 25, '03, bearing numbers 25902 and 724 Public Museum, Milwaukee.

This species is nearest to *T. praedator* Fox, but it differs as follows: the anterior margin of the clypeus does not have two lobes in the middle, the scutellum is not impressed, the metanotum is more strongly furrowed, the abdomen is broader at the base, the pubescence of the pygidium is not nearly so bright, the pubescence of the head and thorax is not bright golden, and the wings are slightly yellowish.

It is also related to *T. calcaratus* Fox, but the fourth and fifth antennal joints are equal, the scutellum is not impressed, furrow of the metanotum is stronger, there is no fovea on the metanotum, the longer spur of the hind tibiae is not so long, pubescence of the pygidium not golden, etc.

The medial produced portion of the clypeus is not strong, and at first this was mistaken for a variety of *T. crassus* Fox, but the metanotum is without a "pyriform fovea" at the apex, and there are four silvery bands on the abdomen instead of three.

The New York specimen has the middle tooth of the clypeus more distinct, but otherwise seems to be the same.

Tachytes birkmanni n. sp.

♀.—Length 10 mm.; length of anterior wing 7 mm. Anterior margin of the clypeus broadly, slightly produced in the middle; the produced portion is rounded, entire; at the side of the produced portion are two rather small teeth; clypeus punctured with large, somewhat irregular punctures. Front and vertex closely punctured; furrow from anterior ocellus to base of antennae; ocellar area parted by a strong furrow; occiput seen from behind depressed by the strong medial line. Distance between the eyes at the top greater than the length of antennal joints 2 + 3,

but less than the length of joints 3 + 4. Third antennal joint a little shorter than the fourth; fourth and fifth equal or the fifth the shortest; apical joint about the same length as the preceding. Dorsulum and scutellum finely, closely punctured; scutellum slightly impressed. Metanotum finely granular, with a very faint medial line, fovea at the apex wanting; bounded on the posterior margin by a line like series of foveae, which meet in the middle in the form of a broad V. Posterior face more coarsely granular, middle line stronger. Third cubital slightly broader on the radial than the second cubital is. Longer spur of the hind tibiae about as long as the first joint of hind tarsi; first joint of hind tarsi not much longer than the second. Abdomen dorsally microscopically punctured; punctures on the first two ventral segments similar to those on the dorsal surface; apical margin of the second ventral segment smooth, shining; apical part of segments 3-6 beneath with close punctures; apical margins of the ventral segments with some long bristle-like hairs. Pygidium rather truncate at the apex.

Black; palpi and apical joints of tarsi brownish; tegulae testaceous; abdomen clear red, apical segments slightly darker. Wings clear hyaline, iridescent; venation pale brown. Face, clypeus, mandibles, cheeks, thorax (more especially the plurae and pectus), inside of four anterior femora, tibiae and tarsi, apical two-thirds of inside of posterior tibiae (the basal third has golden pubescence), apical margin of abdominal segments 1-4 with silvery pubescence. The pubescence of the abdomen is not very dense. Pygidium with dense golden pubescence.

Hab.—Lee Co., Texas, May, 1907 (G. Birkmann).

I take great pleasure in naming this handsome little wasp after an energetic collector, Rev. G. Birhmann.

This species looks very much like a *Tachysphex*, but the appressed hair on the pygidium at once excludes it from that genus.

It undoubtedly belongs to Section II of Fox. In his table for this section it runs to *obductus* Fox, but it is very different from this species. Besides the difference in color from *obductus* the third antennal joint is shorter, the scutellum is impressed, the metanotum does not have a distinct fovea, etc.

T. rufofasciatus Cress. is the only other described species of the section which has black legs and a rufous abdomen, so a comparison with it may be useful. *T. birkmanni* may be known from *T. rufofasciatus* Cresson by its smaller size, the impressed scutellum, the metanotum with a slight furrow, pubescence silvery instead of golden, and the presence of two lateral teeth on the anterior margin of the clypeus.

Tachytes praedator Fox.

Three females and three males, Lee Co., Texas (G. Birkmann). The scape and mandibles are black sometimes. The femora of all the specimens before me are ferruginous for the apical two-thirds.

Tachytes mandibularis Patt.

Female, Fedor, Texas, Oct. 11, 1905 (G. Birkman). This is 19 mm. long, and the femora are largely ferruginous. It seems to agree otherwise.

Tachytes pepticus Say,

A ♂, Wellsville, Kansas, August 3, 1901 (S. A. Johnson), is almost typical. It is in the collection of the Colorado Agricultural College. Many males collected at Fedor, Texas, by Rev. G. Birkmann. Also two females from the same locality. These are not typical and may represent a distinct species. A ♂, Boulder, Colorado, July 20, 1908 (S. A. Rohwer), had the eyes in life bright green below and darker above.

Tachytes aurulentus Fabr.

A ♂ and ♀, Lee Co., Texas, August, 1907, and a ♀ same locality, Sept. 6, 1907 (G. Birkmann). The wings are much darker than usual for this species, being almost black. The last mentioned ♀ has the anterior margin of the clypeus slightly more acute at the middle and the pubescence of the front is golden.

Tachytes obductus Fox.

A ♀, Fedor, Texas, August, 1905, ♀ Lee Co., June, 1906 (G. Birkmann). New to Texas.

Tachytes distinctus Sm.

Three females and three males, Lee Co., Texas (G. Birkmann); 2 females, Paris, Texas (C. R. Jones); ♂, Wellsville, Kansas, Aug. 16, 1901; ♂, Julesburg' Colo., August 4, 1899. The last four are in the collection of the Colorado Agricultural College. The pubescence in some of the specimens is golden instead of silvery.

I take the opportunity to correct a mistake made by myself in the ENT. NEWS, May, 1908, p. 224. The ♂ recorded from Roswell, N. M., as *T. crassus* Patton is a ♂ of *T. distinctus* Sm. So far *T. crassus* has not been taken in New Mexico.

Tachytes rufofasciatus Cress.

Many males and females from Lee Co., Texas, collected from June to September (G. Birkmann). The females vary greatly in size. The abdomen of the male in many of the specimens is black, with the apical margin testaceous. The wings are yellowish hyaline, nervures pale testaceous. The spines on the tibiæ are white.

Tachytes obscurus Cress.

Three females and six males, Lee Co., Texas, June to Aug. (G. Birkmann). The females are typical, but the males do not quite agree with Fox's description. They are undoubtedly the ♂ of the ♀ which agrees. The elongate process on the fore coxae is very short and there is a long bristle-like hair, which is white, at the apex of each. The abdomen has more silvery pubescence than the ♀.

Tachytes dubitatus n. sp.

♀.—Length 13 mm. Anterior margin of the clypeus produced in the middle into a broad lobe which is slightly emarginate; at the sides there are three small teeth, the outer one much more distinct, the inner one is very small; the above description is from the under side, from above it is not so plain. A distinct furrow from anterior ocellus to base of antennae, this is obscured by the hair of the front. Depressed area behind lateral ocelli not strong; the vertex is not parted by a furrow. Vertex with large, separate punctures along the orbits, over the entire vertex are small, rather close punctures. Sparse between the eyes at the top, not quite as great as the length of antennal joints 2 + 3. Third antennal joint a little longer than the fourth; the fourth and fifth joints equal in length; apical joint a little longer than the preceding one. Dorsulum distinctly, although not strongly, rather closely punctured. Scutellum more finely punctured, slightly impressed. Metanotum rather coarsely granular, a rather indistinct median furrow which is at the apex broadened into a rather shallow fovea. Posterior face more finely granular, the middle furrow distinct. Metathoric spiracles about the same as those of *propinquus* Roh. Tibiae and tarsi distinctly spinose. Longest spur of hind tibiae about the same length as the basal joint of the hind tarsi, if anything slightly longer. Second cubital on radial distinctly wider than third. Dorsal segments of the abdomen under the compound microscope are finely tessellated. Apical margins of ventral segments 3 6 and the side of the sixth closely punctured; along the apical ventral margin of three, four and five is a row of long brown bristles. Pygidium more acute than usual. Black; apex of mandibles and scape beneath piceous; palpi,

tegulae, legs below the extreme apex of the femora ferruginous. Wings yellowish hyaline, venation ferruginous. Front, clypeus, thorax more sparsely, femora and pygidium with golden pubescence; apical dorsal margins of segments 1-4 and ventral 2-4 with silvery pubescence.

♂.—Length 12 mm. Anterior margin of clypeus in the middle produced into a low, slightly emarginate lobe; three fairly distinct lateral teeth. Furrow from lower ocellus not as strong as in the ♀. Vertex like ♀, except there is a faint median furrow. Four basal joints of flagellum rounded out beneath, the fifth slightly so; first joint a little longer than the preceding one, straight on the inside margin, oblique on the outer margin. Thorax like ♀, except that perhaps the scutellum is a little more strongly impressed. Legs not strongly spinose. Longest spur of hind tibiae shorter than the basal joint of hind tarsi. Second and third cubitals about the same width on the radius. Eighth ventral segment narrowly angularly notched; lobes broad, obtusely rounded. Black; apical half of mandibles piceous; palpi, tegulae, knees and legs below, ferruginous. Wings yellowish; venation ferruginous. Front and clypeus with golden pubescence; thorax, femora and basal segment of abdomen with long fulvous; apical dorsal margin of abdominal segments 1-5 and ventral 2-4, also the pygidial area with silvery pubescence. In one ♂ the silvery pubescence of the fifth dorsal segment is wanting.

Hab.—A ♁ and ♀, Milwaukee Co., Wis., number 22322, and a ♁, Racine Co., Wis., number 24483. Types in the Public Museum of Milwaukee.

In Fox's Monograph of the North American Species of Tachytes [Trans. Am. Ent. Soc., xix, 1892], the female runs between *praedator* Fox and *calcaratus* Fox. From *praedator* it may be known by the smaller teeth of the clypeus; the presence of the large punctures on the superior orbits; the broader second cubital cell; the lack of such abundance of golden pubescence. From *calcaratus* it differs in having the middle furrow of metanotum not fainter than in *praedator*, but stronger; the golden pubescence of the front; and it is 3 mm. smaller. It is much like *propinquus* Roh., but the metanotum is not so strongly furrowed, the pygidium is golden, not bronzy, etc.

The above male differs in a number of points from the female but is probably the male of the described female. It was taken in the same locality. In Fox's Monograph the ♂ runs to *validus* Cress., but is smaller, the lobes of the eight ventral segments are broader; the furrow of the vertex is weaker, etc. If it should run to *calcaratus* it would be known from it

by the golden pubescence of the front, the different emargination of the eight ventral segments, etc.

Tachytes calcaratiformis n. sp.

♀.—Length 16 mm. Anterior margin of the clypeus in the middle produced into a rather strong emarginate tooth; sides of the clypeus with three distinct lateral teeth. Except where mentioned, this species species is like *propinquus* Roh. Metanotum but very slightly sulcate, with a distinct fovea at the apex; dorsal abdominal segments more coarsely sculptured; ventral segments more strongly punctured; pubescence of the clypeus silvery or slightly golden.

♂.—Length 17 mm. Slender. Anterior margin of the clypeus not produced in the middle, laterally with three rather small teeth. Except these points it is different from the female; middle sulcus of the vertex stronger; scutellum impressed, middle furrow of metanotum not quite as strong; the pygidium does not have a golden tint. Emargination of the eight ventral segments rounded, perhaps a little deeper than *breviventris* Cress., but very similar.

Hab.—Two males and one female, Van Cortlandt Park, N. Y., September 12, '03, numbers 25902 and 932. Types in the Public Museum of Milwaukee.

The female is almost like *Calcaratus* Fox, differing only from Fox's description in not having the scutellum impressed, and having the pygidium more silvery.

The male is also close to *calcaratus* Fox, but the teeth of the clypeus are more distinct; the lobes of the eight ventral segments are straight on the outer margin, and the emargination is deeper—more like *breviventris* Cress. From *breviventris* it may be easily known by the longer spur of the hind tibiae being longer than the basal joint of the hind tarsi.

Calcaratus Fox, *propinquus* Roh., *dubitatus* Roh. and *calcaratiformis* Roh. are all closely related. They are not as distinct species as most of the other described *Tachytes*, yet I do not think that they are varieties. They may be separated as follows:

Males . . . . . 1.
Females . . . . . 3.
1. Emargination of the eight ventral plate narrow, not very deep, lobes broad; front with golden pubescence . . . . . **dubitatus.**
Emargination of the eight ventral plate much broader; front with silvery pubescence . . . . . 2.

2. Lateral margin of the lobes of the eight ventral abdominal segments curved; clypeus with two lateral teeth . . . . . **calcaratus.**
   Lateral margin of the lobes of the eight ventral abdominal segments straight; clypeus with three lateral teeth . . . **calcaratiformis.**
3. Pubescence of the pygidium bronzy . . . . . **propinquus.**
   Pubescence of the pygidium golden or with a golden tint . . . . . 4.
4. Front with golden pubescence (scutellum slightly impressed). **dubitatus.**
   Front with silvery pubescence . . . . . 5.
5. Scutellum impressed; pubescence of pygidium bright golden. **calcatus.**
   Scutellum not impressed; pubescence of the pygidium with a silvery appearance . . . . . **calcaratiformis.**

Tachytes obscuranus n. sp.

♀.—Length 8 mm. Anterior margin of the clypeus gently rounded, at the sides with a very large tooth, outside of these large teeth are two very small teeth; about half-way up on the clypeus and directly above each of the large lateral teeth is a tooth-like projection; inside of the tooth-like projection is a smaller one; clypeus is closely punctured. A distinct shining line from lower ocellus to base of antennae. Front sparsely punctured; interocellar area closely punctured; vertex with some large punctures near the orbits, the rest finely tessellated. Occiput seen from the front slightly depressed; the middle line of the vertex distinct. Space between the eyes at the vertex not as great as the length of the antennal joints 2 + 3. Scape long, narrow, more like *Tachysphex;* antennal joints 3, 4 and 5 of equal length. Dorsulum closely punctured. Scutellum a little more sparsely so; not impressed. Metanotum somewhat shining, very finely sculptured, the middle line distinct, at the apex it broadens into a shining, triangular fovea; posterior face with an elongate fovea; metaplurae shining. Legs rather strongly spinose; spines on the posterior tibiae pallid, long, acute; longer spur of posterior tibiae as long as the basitarsus. Radial cell rounded at the apex; second cubital a little broader on the radius than third cubital Abdomen dorsally finely tessellate; second ventral segment mostly closely finely punctured or tessellate; third and fourth segments with large punctures. Pygidium sparsely penctured with large punctures. Black; mandibles, spot on scape beneath, apical joints of tarsi rufous; tegulae ferruginous. Front, clypeus, femora, tibiae, plurae, pectus, abdomen dorsally (more strongly so on the apical margins) with dense silvery pubescence; metathorax with long white hairs. Pygidium rather sparsely clothed with silvery hairs. Wings hyaline, slightly yellowish, iridescent; venation ferruginous.

♂.—Length 7 mm. Clypeus very slightly produced medially, with the lateral angles a little produced so as to give it a wavy appearance. Emargination of the fore femora beneath shallow. Spine on the fore coxae short, with a long white bristle at the apex. Emargination of eight ven-

tral plate deeply angular. Abdomen closely, rather strongly punctured, metathorax finely granular. Venation brown, wings not yellowish. Mandibles (species piceous) and scape black. Except where mentioned this is like the female.

Hab.—Five females and five males, Lee County, Texas (G. Birkman). Most of them were taken in Fedor. The dates are May 28th, June 6th, 19th, 21st, 26th, August, in different years.

This species is close to *T. obscurus* Cress. The female may be known by its smaller size; the different sculpture of the clypeus, which is very distinct; the silvery color of the pygidium, etc. The male may be separated by the longer third antennal joint; the slight indicated middle line, the more angular emargination of the eight ventral plate and the close eyes.

In Fox's Monograph of the *Tachytes* of North America this species runs to *sericatus* Cress. to which it is closeiy related, but it may be separated from that species as follows: the clypeus of the female is different; the metanotum in the female is much different, being more shining; the pygidium is not bronzy; the longer third antennal joint of the ♂; eighth ventral abdominal plate is angularly emarginate; and being smaller in size.

DIADASIA NITIDIFRONS AND D. SKINNERI.—The original type of the bee *Diadasia nitidifrons* Ckll., from Banning, California, has the abdomen largely denuded of pubescence. In Trans. Amer. Ent. Soc., xxxii, p. 73, I described what I regarded as a more perfect specimen of the species, taken by Dr. Skinner at Silver Lake, Utah, 8,600 ft. This was a very remarkable extension of the range, but I did not believe I had to do with a distinct species. I now have before me a perfect male of undoubtedly genuine *D. nitidifrons*, taken by Mr. Eldred Jenne at N. Yakima, Wash., June 24, 1903. This is larger than the Utah specimen and has the abdomen beset all over with erect dull white hair, without any appearance of bands. There is no black hair at the bases of segments 2 and 3, but there is some at the base of 6. The Utah insect clearly represents a distinct species (*D. Skinneri* n. sp.), peculiar for its small size (length about 7 mm.), and the black hair at the bases of abdominal segments 2 and 3. Seen from above, nearly the basal half of these two segments appears shining black, the rest of the segment being relatively dull, while the hind margins of segments 2 to 4 have evident fringes of white hair.—T. D. A. COCKERELL.

Additional Bibliography on Flies and Mosquitoes as Carriers of Disease.*

Compiled by WM. PAUL GERHARD, C. E.

(See also the February, 1909, issue of ENTOMOLOGICAL NEWS.)

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NOTE.—Through the kindness of several entomologists and other persons interested in Mosquito and Fly Extermination, the author is enabled to present the above addition to his Bibliography, published in th February Number. Further contributions to the bibliography would be gratefully appreciated by the author. (Address 33 Union Square, New York City.)

A new species of Orocharis (Gryllidae) from British Honduras.

BY JAMES A. G. REHN.

Orocharis latifrons n. sp.

Type: ♀; Benque Viejo, British Honduras. 1907. [Acad. Nat. Sci. Phila.]

Allied to *O. gaumeri* Saussure from Valladolid, Yucatan, but differing in the broader rostrum, which is as broad as the proximal antennal joint instead of half as broad, and in the absence of solid black from the pronotum and angle of tegmina.

Size rather large (for the genus); form quite elongate; surface moderately hirsute. Head with its dorsal length about two-thirds that of the pronotum, occiput regularly declivent to the rostrum, slightly concave transversely between the eyes; rostrum moderately protuberant, rounded obtuse-angulate when seen from the side, the width of the rostrum about as much as that of the proximal joint of the antennae; ocelli drominent, elongate-elliptical in shape, disposed in a slightly arcuate line, the lateral ones each slightly larger than the middle one and faintly constricted in the middle; eyes moderately prominent, more so cephalad that laterad, in shape subpyriform; antennae nearly twice the length of the body, the proximal joint large, moderately depressed, slightly sinuate when seen from the side; terminal palpal joint slightly arcuate, obliquely truncate at the apex. Pronotum with the greatest caudal width about one and a half times the length, the lateral margins converging cephalad; cephalic margin emarginato-truncate; caudal margin very slightly obtuse-angulate; the angle hardly apparent and the margin slightly sinuate laterad; lateral lobes of the pronotum slightly longer than deep, regularly arcuate ventrad. Tegmina a third longer than the body, distinctly exceeding the tips of the caudal femora; costal field quite broad, proximad and mesad, much narrowed distad by the decided emargination of the costal margin, mediastine vein with about fifteen rami. Wings caudate, extending be-

Dorsal view of head and pronotum.

yond the tegmina a distance about equal to the length of the pronotum. Abdominal styles long and tapering, about half the length of the ovipositor, the latter being slightly longer than the body, slender, slightly arcuate dorsad in the proximal half, the apex armed ventrad with blunt teeth, the immediate apex very sharp; subgenital plate obtuse-angulate emarginate at the apex. Caudal femora slightly less than the body in length, not very robust, the greatest width contained about four times in the length; caudal tibiae hardly exceeding the femora in length.

General color wood brown, the limbs slightly tinged with mars brown, the head with cinnamon-rufous, the tegmina with their neuration but little relieved from the base color, and the abdomen and ovipositor near burnt umber in tone. Eyes cinnamon; antennae of the general color, faintly annulate distad; angle of the tegmina narrowly lined with pale yellow and this finely interrupted with blackish spots and points; apex of the ovipositor blackish; limbs more or less obscurely sprinkled with minute umber spots.

MEASUREMENTS.

Length of body	16. mm.
Length of pronotum	3. "
Greatest caudal width of the same	4.3 "
Length of tegmen	20.5 "
Length of caudal femur	13 5 "
Length of ovipositor	17.5 "

The unique type was submitted to me for examination by Dr. H. T. Fernald, of Amherst, Mass.

A New Walking-Stick of the Genus Diapheromera from Mexico.

BY JAMES A. G. REHN.

Diapheromera (Ceratites) tamaulipensis n. sp.

1904. *Diapheromera calcarata* Rehn, Proc. Acad. Nat. Sci. Phila., 1904, p. 50. [In part.]

Types, ♂ and ♀; Alta Mira, Tamaulipas, Mexico, June 28, 1903 (M. E. Hoag). [Acad. Nat. Sci. Phila.]

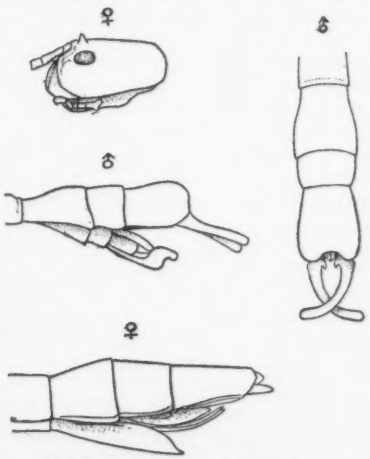
A member of the recently erected subgenus *Ceratites* Rehn and Hebard* possessing cephalic horns† and in the male having the apical margin of the subgenital opercule ampliate. When compared with *covilleae* Rehn and Hebard, the type of

* Proc. Acad. Nat. Sci., Phila., 1909, p. 126.

† The horns of the female type are very well marked, but none are present in the male type. As twenty-six specimens of this subgenus have been examined, and all possess horns except this male, it seems highly probable that their absence is purely accidental.

the subfamily, *tamaulipensis* is seen to be slenderer with decidedly narrower head and pronotum, more elongate abdominal segments, longer limbs and smaller eyes. When the male is compared with a male of *Diapheromera calcarata* from Jalisco, Mexico, the slender form and the subgeneric characters at once separate the two.

Size rather large; form quite slender; surface smooth. Head a half to a third again the length of the pronotum, slightly broader at the eyes than caudad, but the increase in width cephalad is slight, the greatest width slightly less than the length; occiput smooth, interocular region with a pair of low, blunt, divergent horns, each situated caudad of the articulation of the antennae;* eyes globose, moderately prominent; proximal antennal joint somewhat depressed. Pronotum nearly half again as long as broad, subequal in the male, slightly constricted mesad in the female; mediolongitudinal sulcus slight, medio-transverse sulcus prominent, slightly arcuate caudad. Mesonotum about twice (♀) or thrice (♂) the length of the head and pronotum together; very slender and moderately expanded caudad in the male, more robust and somewhat expanded caudad in the female. Metanotum with the median segment equal to mesonotum in the male and slightly shorter in the female, similar to that segment in shape in both sexes; median segment transverse, the cephalic margin slightly arcuate cephalad. Abdomen about equal to (♂) or distinctly longer than (♀) the head and thoracic segments, the joints decidedly (♂) or moderately (♀) elongate, the six proximal ones similar in character, but slightly decreasing in length. Male with the seventh dorsal abdominal segment distinctly longer than half the sixth segment, inflated but not much expanded laterad; eighth dorsal segment of the male transverse, not more than half the length of the seventh seg-



Diapheromera (*Ceratites*) *tamaulipensis* n. sp.—Lateral view of head of female and apices of abdomen of male and female and dorsal view of apex of male abdomen (x 4).

* Absent in the male, but see footnote †.

ment; ninth dorsal segment of the male hardly shorter than the seventh, slightly inflated, hardly at all expanded, apical margin arcuato-emarginate; supra-anal plate of the male very short, obtuse-angulate, carinate; cerci slightly longer than the ninth dorsal abdominal segment, rounded, well curved inward toward the median line, the apical portion slightly bent, thickened and blunt, a slight, moderately acute spine at the internal base, eighth ventral segment quite short, not reaching to the apical margin of the eighth dorsal segment; subgenital opercule elongate, reaching to the apex of the ninth dorsal segment, narrow, the apex "spout-shaped," the margin bent on itself then somewhat expanded and shallowly emarginate at the apex, the lateral margins of the terminal portion of the plate arcuate when seen from the side. Seventh dorsal abdominal segment in the female, about half as long as the sixth; eighth dorsal segment slightly shorter than the seventh; ninth dorsal segment nearly twice the length of the eighth, compressed, slightly carinate dorsad at the apex, the apical margin with a rectangulate median emargination, which exposes the rotundato-angulate supra-anal plate; cerci nearly half the length of the ninth dorsal segment, lanceolate-conic; subgenital opercule produced, reaching to the apical margin of the eighth dorsal segment, compressed, subequal, the apex rectangulate. Limbs very long and slender in the male, the median femora inflated much as in *D. calcarata*, the limbs in the female much shorter and more robust. Cephalic femora of the male slightly longer than the pronotum and mesonotum together, tibiae slightly exceeding the femora: median femora about equal to the metanotum without median segment, tibiae distinctly longer than the femora; caudal femora reaching to the apex of the fourth abdominal segment, tibiae distinctly longer than the femora. Spine on the median femora of the male very stout; the carinae regularly but not very strongly serrato-dentate; ventral carinae of the tibiae rather strongly serrato-dentate; spine on the caudal femora slenderer and more acute than on the median femora, the carinae of the caudal femora and tibiae serrato-dentate as in the median limbs but in a less decided manner. Cephalic femora of the female about equal in length to the pronotum and mesonotum, tibiae slightly longer than the femora; median femora about equal to the metanotum with median segment, the tibiae equal to the femora; caudal femora reaching to the middle of the fourth abdominal segment, tibiae subequal to the femora. Spines on the median and caudal femora of the female much smaller than in the male, but of fair size.

General color of the male ochraceous, becoming pale oil green on the cephalic limbs, median and caudal tibiae. Apex of the abdomen prout's brown; eyes seal brown; a narrow postocular bar bistre. General color of the female seal brown, beeoming wood brown on the head, prothorax, cephalic portion of the mesothorax and on the apex of the abdomen, the femora and tibiae somewhat mottled with the two shades, eyes burnt umber.

MEASUREMENTS.

	♂	♀
Length of body	88. mm.	77. mm.
Length of pronotum	3.2 "	3.5 "
Length of mesonotum	20. "	17.5 "
Length of metanotum (Including median segment.)	20. "	15. "
Length of cephalic femur	24. "	20. "
Length of median femur	18.8 "	15.2 "
Length of caudal femur	24.5 "	19. "

The types are the only specimens of this interesting species which have been seen by the author.

Description of a Mexican Aleyrodes.

BY T. D. A. COCKERELL.

In Entomological News, 1903, I published a short note on *Aleyrodes vitrinellus*, a new species from Mexico. The full description was sent to Professor Herrera to publish in Mexico, but it was apparently mislaid or lost, as it has never appeared. It therefore seems necessary to give the particulars here, the original short note being inadequate. The species is of some importance just now, owing to the great attention being given to the Aleyrodidæ of *Citrus*.

Imago.—Yellow; eyes undivided; a bright orange stripe (apparently internal) extends from the posterior part of the thorax to about the middle of the abdomen.

Pupa.—Pale yellowish or colorless, very much like that of *A. floridensis*, but larger (900 μ. long; *floridensis* is not over 700 μ.), without the dark markings, and with a longer fringe, with more rods united, so that it seems coarser; the rods are straight. Surface of pupa strongly granular; margin double, one edge crenulated and the other (upper) one crowded with regular short tooth-like pointed projections; this is a condition very similar to that of *A floridensis*. There are more or less obvious dorsal and sub-dorsal longitudinal series of low tubercles. Margin with long radiating glass-like rods. No dorsal secretion.

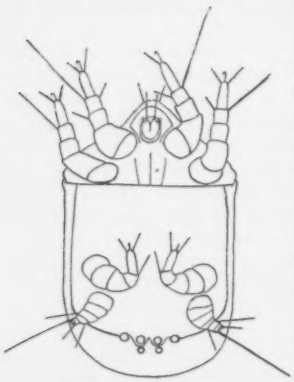
Vasiform orifice about 54 μ. long, broad-cordiform, the apex (posterior end) very faintly notched; operculum very broad, the apical margin gently convex; lingua broad spatulate, the apical portion rather obscurely crenulate. In all this there is a general resemblance to these parts in *A. variabilis*, but in *A. vitrinellus* the vasiform orifice is much broader, with the apical notch very much fainter, and the operculum is very much less pointed, while the lingua is not so strongly crenulated.

Hab.—Garden of Netzahualcoyotl, Texcoco, Mexico (*A. L. Herrera*, No. 700). On the under side of leaves which appear to be those of orange, with much black fungus.

A Parasite Found on a Flea.

By Passed Assistant Surgeon CARROL FOX, P.H. and M.H.S.
Oakland, California.

During the examination of thousands of specimens of rat fleas, there was observed on three occasions a very small mite attached to the female of the *Ceratophyllus fasciatus*. On the first occasion but one mite was present, but subsequently two females were found, one with five and the other with seven mites attached. These mites were able to move about freely on the surface of the flea, but usually seemed to cling with their hind legs or sucking discs to one segment, of the flea, the anterior legs being free, thus permitting the other segments to move freely beneath them. At first it was thought that this might be a true parasite of the flea, possibly belonging to the family Canestriniidae, but the mere fact of having examined thousands of specimens of fleas and only encountering this mite three times would of itself negative such a possibility and it is therefore thought that the mite under consideration is probably the hypopial stage of the family Tyroglyphidae. It is the first time I think than an *Acarina* has been reported from the *Siphonaptera*.



Parasite found on a Flea.

Unfortunately the mite was not carefully studied while alive, and after mounting it was found difficult to make out its anatomy.

Its size is .210 x .130 mm. There is a demarkation between the cephalothorax and abdomen. The mouth parts are retracted and very indistinct There are four pairs of legs, the two anterior and the two posterior being widely separated. The first and second legs terminate in a hook, as does also probably the third. The tarsal joint of the last leg has a long hair. Some of the segments of this and the other legs also contain a few hairs. Ventrally towards the end of the abdomen are five discs, which probably serve as sucking discs.

The Late Professor Slingerland.*

By J. H. Comstock.

Mark Vernon Slingerland, Assistant Professor of Economic Entomology in Cornell University, died of Bright's disease at his home in Ithaca, March 10th. His health had been failing for some time, but to most of his friends his death was unexpected.

Professor Slingerland was born in Otto, Cattaraugus Co., N. Y., on October 3, 1864. He was a son of Jacob A. and Mary (Ballard) Slingerland. He was educated in the Otto village school and in the Chamberlain Institute at Randolph, N. Y. In 1887 he entered Cornell, and in 1892 he was graduated with the degree of Bachelor of Science in Agriculture. He obtained special mention for special study with marked proficiency in Entomology during the last two years of his course. From 1890 till 1904 he was assistant entomologist in the Agricultural Experiment Station, and in 1899 he was appointed Assistant Professor of Economic Entomology.

Professor Slingerland was a member of the Holland Society of New York; the American Association of Economic Entomologists (of which he was president in 1903); the Entomological Association of Washington; the National Mosquito Extermination Society, and the Society of Sigma Xi (Vice-President of the Cornell Chapter in 1903 and 1904), and a Fellow of the American Association for the Advancement of Science.

Professor Slingerland married in 1891 Miss Effie B. Earll, who was a special student in the University in 1889–91. She survives him, with one daughter.

Although Professor Slingerland has barely reached middle life, he was recognized as being one of the foremost workers in economic entomology, and had attained an international reputation.

He was a prolific writer; he had published many bulletins, and had contributed much to the periodical press, especially to The Rural New Yorker: Country Life in America; The

* This obituary by Prof. Comstock appeared in the Journal of Economic Entomology (2, 195, 1909), accompanied by an excellent portrait of Prof. Slingerland.

American Agriculturist; The National Nurserymen; THE ENTOMOLGICAL NEWS and the Canadian Entomologist. He was a contributor to the Encyclopedia of American Agriculture. At the time of his death he had in preparation a volume entitled "Insects Injurious to Fruit," which was to appear in Macmillan's Rural Science Series.

The position he attained was reached by untiring industry and a devotion to truth; his work was characterized by painstaking thoroughness and an absence of anything sensational. His constant aim was to determine the exact and complete truth and to present what he discovered in a clear manner. In this he was very successful, both in the class room and as a writer.

The bulletins that he published were in a marked degree monographic. Instead of writing about many insects, he selected a few and diccussed them thoroughly, working up so far as possible every detail in the life-history of the species studied. It was doubtless this feature that caused his work to be so widely known in other lands. For example, his treatise on the Codling Moth was translated into Russian and published in that language.

A striking feature of Professor Slingerland's bulletins is the excellence of the illustrations; no one else has been so successful as he in photographing entomological subjects; and his lantern slides of insects, colored by Mrs. Slingerland, are unsurpassed.

Although his work is characterized by the highest degree of scientific accuracy, he never forgot that the object of his work was to aid those that till the soil. He never allowed his interest in the purely scientific aspects of the subjects studied to cause him to neglect the practical applications of the results obtained. A marked instance of this was his invention of the "Spray Calendar;" for he devieed the first tabular calendar arrangement of spraying suggestions. This was printed and used at Farmers' Institutes in 1894. The value of this method of publication was apparent at once; and it has been generally adopted by experiment stations.

Professor Slingerland took an active part in various scien-

tific and horticultural societies. He was President of the Association of Economic Entomologists in 1903; Chairman of the Entomological Section of the Association of American Agricultural Colleges and Experiment Station in 1903; Chairman of the Committee on Entomology of the Western New York Horticultural Society, 1895–1904 inclusive; and Chairman of the Committee on Entomology of the New York State Fruit Growers' Association in 1903.

As a teacher he was clear, direct and painstaking. He had the keenest interest in the needs of each individual student. Only a few hours before his death he discussed with a colleague the work of several of his students. Even at that hour his thought was not of himself but of his students.

In this manner closed the life of one who, although given but few years to work, accomplished much, and who endeared himself to others by his sterling qualities as a man and a friend.

ORTHOPTERAN MISCEGENATION.—On October 12th, 1908, about noon, the writer was collecting in a meadow near St. Louis, Mo., when his attention was attracted by an unusual pair of grasshoppers, very dissimilar in appearance, that appeared to be *in copulo*. It was the height of the fall mating and hundreds of pairs were to be seen everywhere, but one glance at the 'hoppers mentioned showed them to belong to different species. Carefully capturing the pair they were brought into the laboratory and introduced into a dirt bottomed breeding cage, undisturbed. Here they remained, *in copulo*, for two days. The morning of October 15th, however, found them both dead in the bottom of the cage,—the immediate cause of death not apparent.

Investigation proved the male to be the common *Melanoplus femur-rubrum* while the female was identified by Mr. Caudell as *Hippiscus rugosa* Scudder. Two locusts more dissimilar in appearance could hardly be imagined. Leaving out of consideration the brilliant coloration of the female in comparison with the more modest male,—the broad flat "face" and thick-set, clumsy, build of the former offers such a contrast that any amateur, let alone a grasshopper, ought to see the difference at a glance.

It is, of course, not astonishing that fertile eggs should not be laid after such a union, but it is surprising enough that it should occur at all. Hybrids between related species of locusts are doubtless more common than hitherto supposed, but if by artificially modifying natural conditions a well-known laboratory investigator can fertilize sea urchin eggs with starfish sperm it is not difficult to believe that Nature in a moment of abstraction might permit the fertilization of *Hippiscus* eggs by *Melanoplus* sperm producing thereby no one knows what complications for the faithful systematist. At any rate it would be interesting to discover if such unions are at all common occurrences in the field.—J. F. ABBOTT.

Some Apparently New Thysanoptera from Michigan.

By A. Franklin Shull.

The species herein described were taken in Huron County, Michigan, in the summer of 1908, while I was engaged as Entomologist on the Michigan Biological Survey. As it will be some time before the complete Report of the Survey of 1908 is ready for publication, the descriptions of new species are published here with the permission of the Chief Field Naturalist, Dr. A. G. Ruthven. In the preparation of this paper I have become indebted to Dr. W. E. Hinds for assistance in determining some of the older species; to Mr. J. Douglas Hood for the loan of several of his types and for comparing another of my specimens with his own; to Mr. Dudley Moulton for a similar kindness; and to the authorities of the U. S. National Museum for the privilege of examining their collection.

The entire collection is to be deposited in the Museum of the University of Michigan.

Suborder Terebrantia Haliday.

Family THRIPIDAE Uzel.

Genus **HETEROTHRIPS** Hood (1908).

Heterothrips salicis n. sp. (Fig. 1).

Female.—General color of body dark brown, appearing nearly black to the unaided eye by reflected light. Length of body 1 mm.; width of prothorax .21 mm.; width of mesothorax .25 mm.; width of abdomen .28 mm. Length of antennal segments 15 μ, 33 μ, 46 μ, 31 μ, 24 μ, 21 μ, 16 μ, 12 μ, 15 μ.

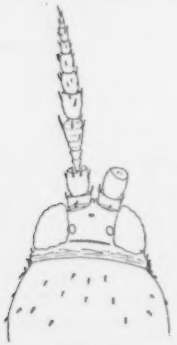


Fig. 1.—*Heterothrips salicis* n. sp.—Head, prothorax and antenna of female.

Head 2.4 times as broad as long, broadest behind. Distinct transverse stria between posterointerior corners of eyes; other striations forming a transversely elongated reticulum near posterior margin. Cheeks behind eyes bearing several short spines directed forward. Frons deeply emarginate between antennae; prominent spine beneath base of each antenna. Eyes black, with light brown margins, projecting prominently in front beside the basal segments of the antennae; spines between facets verysmall. Posterior ocelli situated well back, contiguous with borders of eyes. Mouth cone short, reaching slightly beyond middle of prosternum. Maxillary palpi 3-

segmented, last segment shortest. Antennae 3.4 times as long as exposed portion of head; nine-segmented. Segments 1, 2 and 5-8 barrel-shaped; third vase-shaped, with two conspicuous constrictions and several other less distinct annuli; fourth cup-shaped; *both third and fourth are without distal circle of sensoria;* ninth cylindrical. Segments one, two, and five to nine concolorous with body; third light yellow, palest at base; fourth brownish, paler toward base than at tip. Sense cones and spines of only moderate size, not conspicuous. *Segments are closely united; articulations are brown, not clear.*

Prothorax twice as long as head; sides strongly arcuate; set with numerous short, slightly curved spines, a group of three or four at each angle being more conspicuous than at the middle of the sides; irregular transverse markings dorsally. Mesothorax slightly wider than metathorax; transversely striated. Metathorax with concentric polygonal markings. Fore-wings reaching nearly to or slightly beyond tip of abdomen; brown, paler at base; costal margin decidedly concave, bearing about 28 stout spines which are longer toward the tip, and among which are numerous slender hairs; fore vein with about 24, hind vein with 16 or more short spines placed nearly equidistant from each other throughout; surface of wings covered with minute spines. Legs concolorous with body, except tarsi and distal part of fore tibiae which are yellow; not prominently spinose, but bearing numerous irregular ridges which appear almost like the coarse reticulum on the sides of the thorax and abdomen.

Abdomen widest about the fourth segment. Each segment from the second to the tenth bears dorsally two distinct spines, which are close together in front, gradually diverge to the ninth segment, but are close together on the tenth; a number of smaller spines sometimes fall roughly into two rows along the sides, and into one row ventrally. Posterior borders of segments two to eight prolonged into numerous short spines. Tenth segment split in its median dorsal line through its distal third. Spines around tip of abdomen not very prominent.

Male.—General color sometimes much paler than that of the female. Length of body .72 mm.; width of prothorax .18 mm.; width of mesothorax .21 mm.; width of abdomen .16 mm. Length of antennal segments 10 μ, 23 μ, 37 μ, 33 μ, 21 μ, 21 μ, 15 μ, 12 μ, 14 μ.

Wings are of full length, extending beyond tip of abdomen.

Tip of abdomen bluntly conical. Ventral sides of abdominal segments three to eight with an oblong pale area transversely placed.

Described from numerous females and four males taken July 14, 1908, on the outside of the catkins of the willow, *Salix fluviatilis*. The italicized characters distinguish this species from its congener *H. arisaemae* Hood.

SCIRTOTHRIPS n. gen. (Figs. 2-4).

(σκιρτάω, to leap; θρίψ, a wood-worm.)

Ocelli present. *Head is shorter than broad and shorter than prothorax.* Antennae eight-segmented. Maxillary palpi three-segmented. Legs bearing only medium to weak spines. Wings present, with rugose veins bearing weak spines. *One spine of moderate length is borne by each posterior angle of the prothorax.* None of the body spines stout.

Species of this genus have the power of springing.

This genus reminds one at once of the genus *Anaphothrips* Uzel, but can be at once distinguished from that genus by the above italicized characters. It can be further distinguished from our member of that genus, *A. striatus* (Osborn), by the fact that the sixth antennal segment is not divided by an oblique groove. By proposing the name *Scirtothrips*, I do not wish to imply that the leaping of this insect is remarkable for its vigor; on the contrary, its leap is weaker than that of many other springing species. I do wish, however, to emphasize the fact that it does spring, for it is this character, I believe, which most surely marks the new species as belonging to a genus distinct from *Anaphothrips*. It might be fairly doubted whether two insects so similar in general form and in type of wing should be placed in separate genera merely because the original description of the one genus precluded a short head and a given spine on the prothorax; but when these structural differences are accompanied by a difference of habit, there is good reason for the erection of a new genus, particularly since the habits of thrips, at least in the matter of springing, are more constant than many of the structural characters commonly used to distinguish species.

Scirtothrips ruthveni n. sp. (Figs. 2-4).

Female.—General color of body lemon-yellow, without any shading. Length of body .85 mm.; width of prothorax .15 mm.; width of mesothorax .21 mm.; width of abdomen .21 mm. Length of antennal segments 15 μ, 36 μ, 41 μ, 36 μ, 33 μ, 39 μ, 6 μ, 10 μ.

Head 1.8 times as broad as long. Frons emarginate between antennae. Spines few and weak, those most readily visible being one at each side of the head just behind the eye; others apparently not constant. Eyes black, slightly protruding, sparsely pilose. Ocelli clustered, with red-

dish orange crescents. Mouth cone reaching nearly to posterior edge of prothorax; moderately sharp. Maxillary palpi three-segmented. Antennae eight-segmented, 2.8 times as long as exposed part of head. First segment cylindrical, second barrel-shaped; third and fourth more or less fusiform; fifth and sixth subcylindrical; seventh cylindrical; eighth conical. Third segment distinctly, fourth and fifth slightly, stalked. Bifurcate sense cones on dorsal side of third segment and ventral side of fourth. Spines on antennae distinct, but not prominent. Color uniform yellow.

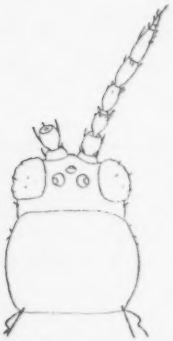


Fig. 2.—*Scirtothrips ruthveni* n. gen. and n. sp.—Head, prothorax and antenna of female.

Prothorax 1.8 times as long, and 1.2 times as wide, as head. Sides considerably arched. Two or three short, curved spines near each anterior angle, one long but weak spine at each posterior angle. Other spines wanting or inconspicuous. Mesothorax with rounded anterior angles. Wings concolorous with body; costal and both interior veins prominent, and rugose, at least in basal part; costa set with about 23 spines, which increase in length to the tip; fore vein with 10 or 11 spines whice are closely set but at unequal distances in the basal half, far apart distally; hind vein with three spines not constantly placed. Entire surface of wing, including veins, covered with minute spines arranged in longitudinal rows which, in the basal half of the wing, are ten to twelve in number. Legs not stout, concolorous with body.

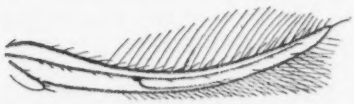


Fig. 3.—*Scirtothrips ruthveni* n. gen. and n. sp.—Right fore-wing of female.

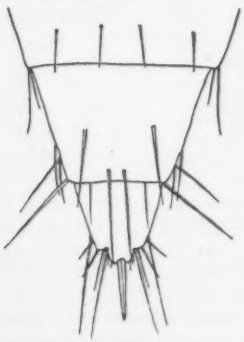


Fig. 4.—*Scirtothrips ruthveni* n. gen. and n. sp.—Tip of abdomen of female, dorsal view.

Abdomen widest about fourth or fifth segment, uniform in color. Ninth segment nearly twice as long as tenth. Spines inconspicuous, except those on segments nine and ten, and these are weaker than frequently found among Thripidae. Ovipositor long, extending considerably beyond tip of abdomen.

Described from seven females taken in the terminal leaf clusters of dogwood, *Cornus stolonifera*, on

July 19, 1908. I take pleasure in naming this species for Dr. A. G. Ruthven, Chief Field Naturalist of the Michigan Biological Survey, in recognition of his aid and kindly interest in all my work.

Genus **ANAPHOTHRIPS** Uzel.

Anaphothrips striatus (Osborn).

Male.—Newly discovered.* Agrees well with the female, except that it is smaller, and the abdomen is more slender and bluntly rounded at the tip. Length of body .83 mm.; width of prothorax .14 mm.; width of prothorax .14 mm.; width of mesothorax .16 mm.; width of abdomen .16 mm. All tarsi, as in female, unarmed.

Two specimens taken with numerous females on sand-binder, *Ammophila arenaria*, July 7, 1908. This species has long been supposed to be parthenogenetic in nature, and was bred parthenogenetically for several generations by Hinds. It may be doubted whether these sporadic males are ever functional.

Genus **BALIOTHRIPS** Haliday.

Baliothrips basalis n. sp. (Fig. 5).

Female.—General color of body brown, appearing to the unaided eye, by reflected light, nearly black, with a transverse white band across the pterothorax. Length of body 1.12 mm.; width of prothorax .20 mm.; width of mesothorax .26 mm.; width of abdomen .26 mm. Length of antennal segments 15 μ, 36 μ, 43 μ, 40 μ, 39 μ, 47 μ, 21 μ.

Head slightly broader than long, cheeks slightly diverging behind the eyes; posterior portion transversely striated. Frons sharply emarginate between antennae. One short postocular spine well toward each side of the head; four, sometimes three, other spines in a transverse row on each side nearer the median line, the innermost one being longest and standing directly behind the ocellus of that side. A spine on either side of the anterior ocellus, nearly between it and the two posterior ocelli, and a longer spine near inner margin of each eye in front. Eyes rather prominent, black, with yellow margins. Ocelli reddish orange, rather close together, posterior ones not contiguous with eyes. Mouth cone reaching slightly past middle of prothorax; maxillary palpi two-segmented. Antennae seven-segmented, 2.2 times as long as head. First segment cylindrical; second barrel-shaped; third to fifth vase-like; sixth broadest near base; seventh slightly tapering.

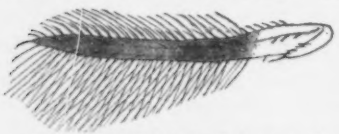


Fig. 5.—*Baliothrips basalis* n. sp.—Left fore-wing of female.

* I have found but one reference to a supposed male of *Anaphothrips striatus*, namely that of L. R. Cary, Bull. 83, Maine Agr. Exp. Station, June, 1902. Cary's figures plainly show that his male was not of this species.

First and second and fifth to seventh segments concolorous with body; third yellow; fourth brownish yellow. Bifurcate sense cone near tip of fourth segment on ventral side is especially noticeable.

Prothorax 1.25 times as long and 1.3 times as wide as head. Two prominent spines at each posterior angle; two much shorter, curved, anteriorly directed ones near each anterior angle; and several other short, curved ones along the sides. Mesothorax with irregular transverse striations. Metathorax with sigmoid longitudinal markings which branch and anastomose. *Pterothorax is not distinctly lighter in color than the rest of the body.* Fore-wings reaching about to tip of abdomen; brown like the body, except a broad area at the base which is white, forming in the uncleared insect a conspicuous transverse white band; third quarter of wing often *slightly* paler than second and fourth quarters; *there is no light fleck near the tip of the wing.* Costal margin set with about thirty rather stout spines which increase in length toward the tip; fore vein with eight to ten weak spines, of which five or six are on the basal two-fifths, the remaining three or four widely separated; hind vein with seven to nine spines on distal two-thirds of wing, slightly farther apart near tip of wing. Surface of wings covered with minute spines arranged in about twenty-one rows. Legs concolorous with body, except tarsi and distal portions of all tibiae, and sometimes proximal end of femora yellow; a row of short stout spines on inner side of hind tibiae, other spines irregularly placed.

Abdomen with long spines on last two segments; shorter spines along the sides; spines on ventral side weak and arranged roughly in a transverse row on each segment; those on dorsal side inconspicuous and irregularly arranged. Tenth segment split above for at least part of its length, sometimes wholly.

Male.—Length of body .87 mm.; width of prothorax .17 mm.; width of mesothorax .23 mm.; width of abdomen .17 mm. Length of antennal segments 15 μ, 30 μ, 38 μ, 39 μ, 33 μ, 46 μ, 21 μ.

Wings are present, with pale area on third quarter distinct, but not as conspicuous as on basal quarter. Legs with bases of femora and most of tibiae yellow, fore femur lightest of the three.

Abdomen bluntly conical. Oblong pale area on ventral side of each of abdominal segments three to seven.

Described from numerous females and four males taken on upper and under sides of leaves of tall millet grass, *Milium effusum*, August 6 to 13, 1908. The italicized characters distinguish this species from *B. dispar* Haliday. I have been compelled to disregard Haliday's inclusion of rudimentary wings in the males as a generic character. His wingless males, moreover, may belong to definite seasons only, as seems often to be the case with other species.

Suborder TUBULIFERA Haliday.

Family PHLOEOTHRIPIDAE Uzel.

Genus **TRICHOTHRIPS** Uzel.

Trichothrips tridentatus n. sp. (Fig. 6).

Female.—General color of body brown or light brown; much red hypodermal pigmentation; except on head and legs. Length of body 1.7 mm.; width of prothorax .24 mm.; width of mesothorax .31 mm.; width of abdomen .38 mm.; length of antennal segments 16 μ, 47 μ, 56 μ, 52 μ, 52 μ, 48 μ, 37 μ, 26 μ.

Head about as broad as long. Cheeks nearly parallel, slightly rough, with several minute spines. Distinct postocular spines on each side. Eyes small, continuous in outline with cheeks and vertex; deep red with yellow margins. Ocelli present, obscured by hypodermal pigmentation.

Fig. 6.—*Trichothrips tridentatus* n. sp.—Antenna beyond second segment, and fore tarsus of female.

Mouth cone long and pointed, extending slightly beyond posterior edge of prosternum; maxillary palpi two-segmented, second segment four or five times as long as first; labial palpi with four spines at tip. Antennae twice as long as head. First segment cylindrical; second barrel-shaped, slightly narrower at base; third to sixth urn-shaped, distinctly stalked; seventh slightly stalked, forming broadly with the eighth, which is roundly conical. Segments all concolorous with body, except second and the base and top of the third, which are yellowish; the second may be clouded basally. A row of six spines on eighth segment continuous with three more on distal part of seventh. One or two simple sense cones on the third to the seventh segments inclusive.

Prothorax about as long, and (exclusive of fore coxae) 1.5 times as wide, as head. Sides strongly divergent in front half; nearly parallel, slightly concave, in posterior half. One spine at each posterior angle. Meso- and metathorax of nearly equal width. Wings present, reaching to sixth or seventh segment of abdomen; sides of fore-wing parallel, strong fringe all around, double for about ten hairs just short of tip on posterior margin; colorless throughout. Legs without hypodermal pigmentation, otherwise concolorous with body, except that the tarsi are light brown, and the tips of all femora are yellow beneath; fore femora slightly enlarged; all tarsi with a small curved tooth; fore coxae with one prominent spine.

Abdomen with sides nearly parallel to seventh segment, thence rounding off to base of tube. Spines distinct but not conspicuous. Tube slender as compared with abdomen; length .14 mm.; breadth of middle .05 mm.

Described from two females taken under the scales of the bark of white oak, *Quercus alba*, August 25, 1908. Readily distinguished from *T. dens* Moulton by the absence of hypodermal pigmentation in head and legs.

Trichothrips brevicruralis n. sp. (Fig. 7).

Female.—General color of body black, nearly opaque even with strong light. Length of body 1.71 mm.; width of prothorax .30 mm.; width of mesothorax .36 mm.; width of abdomen .50 mm. Length of antennal segments 41 μ, 52 μ, 48 μ, 49 μ, 46 μ, 41 μ, 41 μ, 37 μ.

Head very slightly longer than broad; cheeks somewhat arched behind eyes, rough, some of the prominences bearing anteriorly directed spines; surface reticulate, the cells of the reticulum having their long axis transversely placed (visible only in cleared specimens, as are many of the characters mentioned below). Frons roundly emarginate between antennae. Postocular bristles rather prominent, situated over one-third the length of the cheek behind the eyes. Eyes black, with yellowish brown margins. Ocelli present; posterior ones almost contiguous with eyes, and located at about the middle of the latter anteroposteriorly, with a small spine behind each; anterior one almost completely obscured by pigment. Mouth cone blunt and short, reaching but slightly past middle of prosternum; maxillary palpi two-segmented, the second segment four or five times as long as the first. Antennae 8-segmented, 1.6 times as long as head. First segment cylindrical, second barrel-shaped, third to seventh vase-shaped, distinctly but not narrowly stalked; eighth more or less fusiform, with its widest point two-fifths of its length from the base. First segment black; second becoming brown toward tip; third yellowish brown, fourth and fifth becoming gradually darker; sixth to eighth dark brown, except base of the sixth which is paler. The second segment has a circular pale spot above near its tip; the fourth bears on each side distally a short but quite stout simple sense cone; the sense cones on the fifth are less conspicuous; the eighth bears on its dorsal side a row of six spines (exclusive of the apical one) which with three similar spines on the distal third of the seventh segment form a sort of comb.

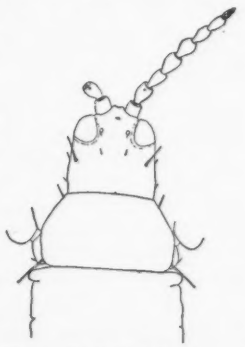


Fig. 7.—*Trichothrips brevicruralis* n. sp.—Head, prothorax, antenna and part of pterothorax.

Prothorax .83 times as long and 1.5 times as broad as head. One moderately long spine at each posterior angle, a short one at each anterior angle; all blunt, those at the posterior angles being, like most of

those on the abdomen, slightly enlarged at the tip. Mesothorax with rather prominent anterior angles, which are nearly right-angled. Wings wanting. Legs short, dark brown to black, except the tarsi which are brown; all tarsi armed with fairly prominent curved teeth. Spines on legs short and comparatively few in number, being most numerous on convex sides of femora.

Abdomen stout, broadly rounding from seventh segment to the tube. The third to eighth segments inclusive bear five or six spines on each side, forming a row extending well on to both dorsal and ventral surfaces. Nearly all abdominal spines enlarged at tip, except on the tube and some on the ninth segment. Color black, except tip of tube which is brown.

Described from five females taken among the leaves of the pine-cone gall on the willow, *Salix fluviatilis*, July 14, 1908. The salient features of this species, one or another of which readily distinguishes it from the majority of the other members of the genus, are the absence of wings, the color of the antennae, the paucity of conspicuous spines on the prothorax, and the fact that all the tarsi are armed.

Genus **ALLOTHRIPS** Hood (1908).

Allothrips megacephalus Hood.

Male.—Newly discovered. Agrees well with the female, except in size, shape of abdomen, and in the fact that the fore tarsi are armed with a small curved tooth. Length of body .81 mm.; width of prothorax .21 mm.; width of mesothorax .21 mm.; width of abdomen .25 mm. Abdomen tapering gradually from third or fourth segment to the tube, not broadly rounded as in the female.

A single specimen taken with three females under the scales of bark of black ash, *Fraxinus nigra*, August 24, 1908. Both antennae lost beyond second segment. The definition of the genus will have to be emended by omitting the character "fore tarsi unarmed."

On Thysanoptera.

By H. J. Franklin, Ph.D.

Of the Minnesota Agricultural Experiment Station, St. Anthony Park, Minn.

ALEURODOTHRIPS n. gen.

This name "White fly thrips" has reference to the fact that the type species is predaceous on the white flies of orange trees in Florida.

Head about as long as broad, with parallel cheeks; eyes

rather small and vertex between them elevated; mouth cone reaching nearly to the hind edge of the prosternum, the labrum blunt. Prothorax about two-thirds as long as the head, each angle bearing a knobbed spine. Fore femora of the male greatly swollen, each over one-half as wide as the head and bearing somewhat proximal of the middle on its inner (anterior) side a long, prominent, slightly curved projection. Each fore tibia of the male with three noticeable denticles or tubercles on its inner side. Fore tarsi of the female unarmed, those of the male with a strong tooth. Wings present in both sexes. Abdomen with a number of prominent knobbed spines on the sides, and with some of the dorsal segments bearing a pair of double curved spines.

Fig. 1.—Left foreleg of *A. fasciapennis*, male, x 194.

This genus is erected for *Cryptothrips fasciapennis* Franklin (Proc. U. S. N. M., vol. xxxiii, p. 727, 1908, Pl. LXIV, figs. 12, 13). The species was originally placed in the genus *Cryptothrips* with considerable doubt, but, as I had only a single specimen to describe from, and that in rather poor condition, I decided it was best not to erect a new genus for it at that time. The male, however, has such remarkably distinct characters that the species cannot be considered to be even closely related, either to *Cryptothrips* or any other genus heretofore described.

I have carefully compared many females from Florida with the type specimen and have been unable to discover enough difference to even consider the Florida specimens as belonging to a distinct variety. The original description of the female should be amended and added to as follows:

Length 1.04–1.21 mm. (the type specimen was stretched to the point of tearing in mounting); width of head .169–.201 mm.; width of mesothorax .258–.33 mm.; greatest width of abdomen .34–.37 mm. General color yellowish brown (the type is slightly darker than the Florida specimens—probably because of its age) with the sixth abdominal segment dark brown—strikingly darker than the rest of the body, the head and prothorax light brown, with a slight tinge of red, darker than the rest of the body, except the sixth segment of the abdomen. By reflected light the hypodermal pigmentation with which the body is irregularly mottled is seen to be whitish or cream color. The last four segments of the abdo-

men, as seen by transmitted light, clear honey yellow. Femora and tibiae of fore legs usually shaded slightly with brownish yellow; the middle and hind legs nearly transparent, except the distal ends of the femora, these being rather strongly stained with light brown. The hind wings are colored much like the fore wings, though with the general color not as dark, and with the basal transparent cross-band much wider (in fact, the basal two-fifths of the wing is almost entirely transparent). The abdomen, when normally retracted, rather chunky and ovate in form.

I have deposited two females in the collection of the U. S. National Museum, one in the collection of the Minnesota Experiment Station, and one besides the type in the collection of the Massachusetts Agricultural College.

Male.—Length .95–1.03 mm.; width of head .15-.16 mm.; width of mesothorax .217-.258 mm. Colored in general much like the female, but with the sixth abdominal segment less strikingly darker than the rest of the body. The head very slightly narrower in front than behind. The abdomen widest at the base, being in that portion of about the same width as the metathorax, and narrowing rapidly toward the tube so as to be triangular in outline as viewed from above or below; the hind angles of most of the abdominal segments square and prominent and bearing one or two stout spines each. The very large fore femora give the male a striking appearance. The prothorax of the male is about four-fifths as long as the head, and the head is often so retracted into the prothorax that they seem to be of about equal length.

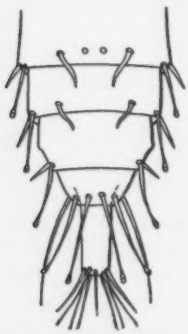


Fig. 2.—Dorsal view of end of abdomen of male, x 194.

Described from three males (the cotypes of this sex), one of which is deposited in each of the three following collections: United States National Museum, Massachusetts Agricultural College and Minnesota Agricultural Experiment Station.

I wish here to acknowledge my indebtedness to Dr. E. A. Back, from whom I received the specimens on which the above descriptions are based. This species was first observed to be associated with the citrus white fly (*A. citris*) by Dr. Morrill in 1906 in connection with the white fly investigation by the Bureau of Entomology of Florida, and has been observed many times in the act of feeding on the larvae, pupae and eggs of this pest fly by both Mr. Morrill and Dr. Bach. They

will make further mention on the habits of this thrips in a forthcoming bulletin of the Bureau of Entomology, U. S. Department of Agriculture.

NOTES ON OTHER SPECIES.

September 19, 1908, I found two females and two larvae of *Megalothrips* (?) *spinosus* Hood under the bark of a dead limb of white birch at St. Anthony Park, St. Paul. The two larvae were both considerably less than half grown and they were purplish red in color. On October 15, 1908, I also discovered a single female of *Trichothrips buffae* Hood at St. Anthony Park, under plum bark.

North American Heteroptera.

BY E. P. VAN DUZEE, Buffalo, New York.

These descriptions may be considered as a second installment of a paper by the same title published in the December, 1906, number of the ENT. NEWS, xvii, pp. 384–391. They represent new species which have come into my hands from various sources.

Thyreocoris montanus n. sp.

Size and general aspect of *lateralis*, but with a broader pale border to the corium. Pronotum more convex, with the lateral margins more rounded, thus giving the insect less of the appearance of being triangularly narrowed anteriorly which we find in the allied species; these margins entire and rounded below the humeri, not longitudinally impressed as in that species. Margins of the cheeks slightly sinuated, the tylus scarcely attaining the apex of the cheeks. In *lateralis* the tylus is distinctly longer than the cheeks, giving the head a more pointed appearance; whole surface closely punctured. Antennae pale, becoming dusky at apex. Legs piceous brown. Elytra: coriaceous portion white, with a black vitta which does not attain the tip. This black vitta is narrower than in *lateralis*, and at base is deflected along the inner margin; when the elytra are closed it conforms to the form of the scutellum leaving the white margin enlarged within and concentric with this scutellar margin which is not the case in *lateralis*. Length 3½–4 mm.

Described from numerous examples representing the following localities: Ogden, Utah, on the Wasatch Mountains (type locality); Provo and Parowan, Utah, Wickham; Wenatche, Washington, Wickham; Riverside, California, Cornell Univ. collection; and Klikitat V., Wyoming. Those from Ogden I

swept from a grassy opening in Williams Canon at at altitude of about 7000 feet.

This is the species I identified as *lateralis* Fabr. in my paper on the North American Pentatomidae in Trans. Amer. Ent. Soc., xxx, p. 8, 1904, where I have given more fully the differential characters separating this species from *lateralis*.

During the four years which have elapsed since the publication of the paper referred to above I have examined carefully a long series of both this species and lateralis Fabr. from most all parts of the United States and have as a consequence found myself obliged to change my views regarding the identity of these forms. I am convinced that the species I described as *gilletti* in 1904 is the true *lateralis* Fabr., and that it is distributed throughout the eastern United States from Massachusetts to southern Florida and southwestwardly to Texas and Mexico. My *montanus* seems to be confined entirely to the Rocky Mountain region and the far northwest. From the description of Fabricius alone it would be difficult to decide which of these species he intended to describe, but their geographical distribution would seem to preclude my former determination.

Sephina grayi n. sp.

Allied to *dorsalis* and *gundlachi*, but nearer to the former in most of its characters. Color testaceous yellow, perhaps inclined to orange in life, marked with black. Head black above and before, with a fulvous dot between the antennae and an oblique yellow line interior to each eye connecting anteriorly with the yellow inferior surface. Antennae black, yellowish pubescent; first, second and fourth joints subequal in length, third shorter. Rostrum black, attaining the anterior line of the intermediate coxae. Pronotum with a large semicircular basal spot, and the humeral angles minutely black. Scutellum, elytral membrane and legs entirely, including the coxae, black. Propleura with a round black spot placed anteriorly; meso- and metapleura with a large lateral black spot and a smaller one between the coxae, those on the mesopleura connected anteriorly. Connexivum alternated with black above and below. Venter marked with a broad black vitta on either side behind the first segment, these vittae deeply eroded within on the hind margin of each segment, this yellow margin narrowest on the fourth and fifth segments where the included median yellow vitta is narrow; genital segment mostly black. Valves of the female of equal length; apex of the male genital segment broadly and regularly arcuated. Length 16–18 mm.; width across the humeri 6 mm.

Described from two male and two female examples taken by Mr. George Gray, the collector for the Wood's Holl Marine Biological Laboratory, in Florida, and kindly sent to me for study by Prof. E. B. Wilson of Columbia University. This large showy insect seems to be strictly intermediate between *dorsalis* White and *gundlachi* Guer. From the former it differs most conspicuously by the alternated connexivum, and from the latter by the unicolorous corium. In some of the examples the apex of the corium is distinctly infuscated, but this may be owing to immaturity.

Oncopeltus spectabilis n. sp.

Closely allied to *gutta* H. S , but with the yellow markings of that species replaced by orange-red. Antennae, rostrum, legs, mesosternum, mesopleura anteriorly, a longitudinal vitta on the intermediate acetabulae, sides and hind margin of the metapleura, apex of the venter, broad hind margin and narrow edges and median line of the posterior lobe of the pronotum, base and median vitta of the scutellum, a transverse vitta on the corium broader on the costa, and the membrane black. Disk of the membrane with a transverse white mark. Head scarlet; tylus black; eyes and ocelli fuscous. Fourth and fifth ventral segments scarlet, with a transverse blackish intermediate vitta. Antennae distinctly pilose; basal joint surpassing the tip of the tylus by at least one-half its length; second longest; fourth scarcely shorter; third rather more than twice the length of the first. Length 10 mm.

Described from one male taken by me at Kingston, Jamaica, and recorded as *O. gutta* in my paper on the Jamaican Hemiptera. At the time of publishing that paper I had not seen the real *gutta* and did not like to describe this form as new on color characters alone. It is quite distinct from *gutta* in its more hairy surface, the longer basal joint of the antennae, the deep orange instead of yellow color, the scarlet head, the narrower black vitta on the elytra and the absence of a black median spot on the anterior lobe of the pronotum. The extent of the black markings may be variable in this species as it is known to be in *gutta*.

Ischnodemus slossoni n. sp.

Closely resembling *falicus*, but with the rostrum longer and the antennae pale at base. Head less strongly punctured than in *falicus;* deep black, scarcely sericeo-pubescent. Antennae rather slender, the apical joint thicker than in the allied species; pale rufo-testaceous at base; third

beyond the middle and the fourth black. Rostrum pale, reaching almost to the middle of the mesosternum; inner surface of the basal joint blackish, extreme tip infuscated. Pronotum oblong, a little widened posteriorly; abruptly arcuately narrowed before; behind the middle with a broad strongly punctured and slightly constricted band behind which the base is almost impunctate and pale rufo-testaceous; surface anteriorly very obscurely punctured, without a discal fova. Legs pale rufo-testaceous; the anterior femora a little darker at base. Scutellum black, distinctly carinate at apex. Elytra testaceous white, an obscure commissural line, the apical margin and two longitudinal streaks, fuscous; nervures of the membrane concolorous at base, strong and blackish posteriorly. Abdomen blackish castaneous; fifth ventral segment forming a broadly rounded sinus, the base of which just passes under the apex of the fourth segment. Length 4½ mm.

Described from two female examples taken at Jacksonville, Florida, by Mrs. Annie Trumbull Slosson, to whom it gives me pleasure to dedicate this interesting addition to our southern fauna. One of these specimens is macropterous and the elytra attain the apex of the fifth tergal segment. The other is brachypterous, and in this they reach only to the middle of the second segment. I took another specimen at Raleigh, North Carolina, on April 17, 1908.

Ischnodemus conicus n. sp.

Allied to *Sallei*. Black; antennae toward its base, narrow hind margin of the pronotum, elytra, osteolar orifices, legs and rostrum testaceous or rufo-testaceous; slender margins of the connexivum pale testaceous. Elytra more or less clouded with fuscous at least along the claval suture and on the apex of the corium; membrane somewhat infuscated, with four strong straight nervures. Antennae: first joint thick, oval, extending for fully half its length beyond the tylus; second and fourth subequal; third scarcely shorter; apical half of the third and fourth blackish. Rostrum reaching to about the middle of the mesosternum. Acetabulae and hind edge of the metasternum conspicuously rufo-testaceous like the orifices and legs. Carinate tip of the scutellum pale. Elytra not completely developed in these specimens, passing the middle of the fourth dorsal segment of the abdomen. Venter clothed with a grey pubescence but showing a slender black line connecting the stigmata, and a black point on each segment below this; all the segments very narrowly edged with pale. Length 7-9 mm.

Described from one pair taken at Galveston, Texas, in May by the late Prof. F. H. Snow, to whom I am indebted for many interesting insects from the southwest.

ENTOMOLOGICAL NEWS.

[The Conductors of ENTOMOLOGICAL NEWS solicit and will thankfully receive items of news likely to interest its readers from any source. The author's name will be given in each case, for the information of cataloguers and bibliographers.]

To Contributors.—All contributions will be considered and passed upon at our earliest convenience, and, as far as may be, will be published according to date of reception. ENTOMOLOGICAL NEWS has reached a circulation, both in numbers and circumference, as to make it necessary to put "copy" into the hands of the printer, for each number, three weeks before date of issue. This should be remembered in sending special or important matter for a certain issue. Twenty-five "extras," without change in form, will be given free, when they are wanted; and this should be so stated on the MS., along with the number desired. The receipt of all papers will be acknowledged.—ED.

PHILADELPHIA, PA., MAY, 1909.

Now that the collecting season is about to begin, the collector is probably contemplating the work for the season. He is cherishing the desire to add to his collection certain desiderata. How much better it would be if he contemplated working out and publishing the life-history or habits of some species. Collecting is valuable work in a way, but the acquisition of knowledge for the benefit of all is the kind of work to be desired. We are often prevented from doing the kind of work for which we are best fitted, but we should always make an effort to do that which is for the best interest of all concerned. We should gradually drift away from the old idea of gathering together a lot of species and ticking them off in a list. Some study of habits would be far more valuable and in the end far more interesting. What we don't know about insects is something startling, and we should endeavor to cut down the great disproportion between the known and the unknown.

FOR THE last two or three years I have devoted most of my time to the *Phytophaga*, especially Mexico and South America. I have collected together a considerable material, and have been struck with the dearth of information in the way of naming foreign specimens to be had in the United States. This has gradually led me to form the determination to specialize on this group, and with this end in view I purchased most of the library of the late Mr. Jacoby, and have also bought the *Phytophaga* of the Van de Poll collection, which includes what is known as the first Jacoby collection, *i. e.* the one formed by him up to and including his work on the "Biologia." This collection embraces about 6000 named

species, including 2000 types and co-types, and is, I believe, the most important collection of that family ever brought to this country, and I hope to make it the nucleus of a larger collection, so that all our foreign material will not have to go to Europe for names. I thought the acquisition of this collection might be of sufficient interest to warrant a little notice in the NEWS.

I suppose my 50 page paper on *Pachybrachys* would hardly interest the NEWS, it is a resumè of all the known species of United States and descriptions of new forms.—FRED. C. BOWDITCH.

MR. EDWARD P. VAN DUZEE, librarian of the Grosvenor Library, Buffalo, N. Y., has recently published an interesting paper in the Bulletin of the Buffalo Society of Natural Sciences, ix, pp. 149-230, entitled "Observations on some Hemiptera taken in Florida in the Spring of 1908." Two new genera and 29 new species are described.

Doings of Societies.

At a regular meeting of the Feldman Collecting Social held, March 17, 1909, at 1523 South 13th Street, Philadelphia, twelve members were present. President Harbeck in the chair.

The members had a discussion on the Pennsylvania species of *Cychrus*, of which Mr. Wenzel said there were six species and one variety: *viduus*, *elevatus*, *ridingsii*, *andrewsii*, *stenostomus*, var. *lecontii*, and *canadensis*.

Mr. Laurent spoke on various lists of Lepidoptera, and said when names have been changed and species placed under different genera they were very hard to find; thinks A. O. U. have the ideal way of arranging same. In the new lists under each species they give the number in the previous lists where these can be found. This lead to a long discussion on lists of different orders: Coleoptera, Diptera, etc., and way of arranging genera and species.

Mr. Harbeck said in some cases where two species are almost identical they have a different way of acting when alive, and if some of the entomologists who do descriptive work would do more field work it would not leave them in any doubt as to where to place them.

Mr. Daecke exhibited a specimen from State collection of a rare dusky form of *Colias philodice* Godt. found near Harrisburg.

Mr. Kaeber exhibited a small copper oven for drying insects.

GEO. M. GREENE, *Secretary*.

The James Fletcher Memorial Fund.

The Ottawa Field-Naturalists' Club, of which Dr. James Fletcher was one of the founders, have thought that his life work was of such a national character that a permanent tribute to his memory should be made. Such a memorial would not only serve to commemorate for all time the good work done by Dr. Fletcher, but would also act as a stimulus to future generations in the study of the fauna and flora of Canada.

Several suggestions have been made as to the form the memorial should take, namely:

(*a*) A fountain at the Central Experimental Farm.

(*b*) A statue to be placed in the grounds of the new Natural History Museum.

(*c*) A bust or portrait to be placed in that building, or at the Central Experiment Farm.

(*d*) To found a bursary at some Canadian University.

Of necessity no decision can be reached until it is known, abproximately at least, what amount of money can be raised.

Signed on behalf of the Committee,

E. R. CAMERON, *Chairman*,
ARTHUR GIBSON, *Sec.-Treas.*,
Central Experimental Farm, Ottawa, Can.

Dr. Fletcher was an honor and credit to Entomology in America, and we sincerely hope that a generous response may come from all America to the appeal of the Committee for funds for this worthy object. Men of note in other branches of science are frequently honored in this way, and entomologists should be proud of the opportunity to so honor one of their fellows.

A meeting of the American Entomological Society was held on February 15, 1909, to commemorate the fiftieth anniversary of the founding of the Society. Dr. Philip P. Calvert, president, in the chair. Members president: Calvert, Cresson, E. T., Cresson, E. T., Jr., Cresson, G. B., H. Smith, Castle, Liebeck, Skinner, Welles, Wenzel, and Laurent. Associates of the En-

tomological Section of the Academy of Natural Sciences of Philadelphia: Harvey, Greene, Rehn, Daecke, Boerner, Ilg, Coxey, Haimbach, Viereck, Matthews and Cole. Visitors: Dr. Stevens of Plymouth, Mass., Charles Morris, G. Warder Cresson, H. A. Wenzel, C. T. Greene, Theo. H. Schmitz and William Beutenmüller of the American Museum of Natural History New York.

The minutes of the first and last meeting were read. Mr. E. T. Cresson read a very interesting history of the Society, and then moved that a committee be appointed to bring the history up to date. The motion was carried, and the president appointed Messrs. Henry C. McCook, B. H. Smith and Henry Skinner. A portrait of Mr. E. T. Cresson was presented and hung in the Entomological Rooms. The vice-president, Mr. Wenzel, being called to the chair, the president, Dr. Calvert, offered the following resolution, which was seconded and unanimously carried:

The American Entomological Society, assembled in meeting February 15, 1909, to commemorate the fiftieth anniversary of the day on which were sent out invitations looking to the formation of this Society, hereby records its sense of gratitude for that measure of age, position and success which it has attained. It recognizes that this attainment has been due to the unselfish labors of many members, both past and present, among them Bland, Blake, Feldman, LeConte, McAllister, Meichel, Newman, Ridings, Wilson, Wilt, Horn, McCook, Angus, Bassett, Grote, Skinner, Eckfelt, Knight, Pine.

It especially rejoices in the presence to-night of one of the three founders of the Society, Mr. E. T. Cresson, who from the very first has continuously exerted himself in its interests, serving as treasurer for thirty-five years, as editor of the Proceedings, later Transactions, for thirty-eight years, and who, the early days of the Society's existence, cared for its collections and library and with his own hands set type for its publications, besides composing a long series of entomological memoirs, principally upon the Hymenoptera, which have given to him and to the Society an honorable distinction, both at home and abroad. To many a younger student he has kindly given

his aid, his advice and his example. He has encouraged and furthered the progress of Entomology in the United States far beyond the limits of his home by his activity as author and by his gift of his most important, valuable and extensive collection of Hymenoptera to this Society. Thankful for all his unceasing labors, this Society now places upon its records, in his presence, its deep appreciation of his services and extends to him its best wishes for many additional years of life and happiness in that field of science which he has cultivated so long and so well.

Mr. Beutenmüller said it was difficult to fitly express the thoughts the occasion demanded. He had always looked upon the American Entomological Society as the mother society, and said its work was favorably known to all working entomologists. Letters of regret on their inability to be present at the meeting were received from Dr. L. O. Howard, Dr. Arthur E. Brown, Dr. John B. Smith, Dr. Henry Tucker, Prof. H. A. Surface, Dr. E. P. Felt and the Rev. Dr. C. J. S. Bethune.

Dr. Howard wrote as follows: "I regret my official duties will keep me in Washington. I should much like to be with you, and especially to listen to the history of your Society as read by my old friend Mr. Cresson. Please give him and the other members of the Society my warm greetings and congratulations. By a curious coincidence the Entomological Society of Washington has just (February 11th) celebrated its twenty-fifth anniversary. At present, you see, your Society is just twice as old as ours, but of course this proportion will not last. Some of these days they will both be very old societies and approximately of the same age. It gave me great pleasure to introduce at our twenty-fifth anniversary meeting a resolution of cordial congratulation to the American Entomological Society which was unanimously adopted, and Mr. H. L. Viereck, now connected with this bureau, was requested to present the congratulations of the Entomological Society of Washington by word of mouth, as he will be with you at the meeting. The American Entomological Society has done a magnificent work, and we all hope that it may continue to grow in strength and power."

Dr. Bethune said, "I thank you very much for sending me an invitation to the commemoration of the fiftieth anniversary of the American Entomological Society. I regret very much that it is quite impossible for me to be present on this interesting occasion. I have been connected with the Society as a corresponding member for about forty-five years and have always taken a great interest in it. Please give my congratulations to Mr. Cresson on his having lived to see this jubilee of the Society which he did so much to sustain. I trust that it will grow and prosper, and that there may be similar anniversaries in the far future."

Mr. Viereck said it gave him great pleasure to be the bearer of greetings from the Entomological Society of Washington.

Mr. Daecke said all in Harrisburg were glad of the successful career of the Society.

Mr. H. W. Wenzel spoke of the great advantages of the collector of the present day. He recalled the difficulties under which his grandfather, Henry Feldman, labored. He collected cork along the shore of the Delaware to make lining for his boxes, and these were made out of soap boxes by his own hands, and his pins were needles. Early morning starts and long tramps were parts of collecting, and they worked hard through love of the subject.

Mr. B. H. Smith said it was a cause of regret that he did not know what was going on on February 15, 1859. He spoke of the difficulty of getting books in the early days. The "Practical Entomologist" introduced him to the Entomological Society of Philadelphia and Mr. Cresson. He also spoke in praise of the publications of the Society.

Mr. Welles expressed his pleasure at being present and also spoke in appreciation of the work of the Society and its members.

Mr. G. B. Cresson recalled some of the days when the Society was on Rodman Street.

Mr. Rehn quoted Dr. H. T. Fernald as saying that Cresson's keys of the Hymenoptera were the most satisfactory ever published.

HENRY SKINNER, *Secretary.*

EXCHANGES.

Not Exceeding Three Lines Free to Subscribers.

☞ These notices are continued as long as our limited space will allow; the new ones are added at the end of the column, and only when necessary those at the top (being longest in) are discontinued.

Wanted—Two male and two female *Argynnis diana* with data. Fresh perfect specimens only. Will pay cash.—William Place, Jr., 13 Parkis Ave., Providence, R. I.

Bred specimens of *Anaea andria* in papers and of *Catocala illecta* on pins. Other Catocalae, *Papilio cresphontes* and pupae of Papilios, Sphinges and Bombycids for exchange.—R. R. Rowley, Louisiana, Mo.

Complete lists of North American insects of all orders for exchange, furnished on application.—Charles H. Withington, Kansas University, Lawrence, Kansas.

For exchange—Mexican moths, principally Sphingidae; wish the larger western butterflies in exchange.—W. R. Walton, 810 N. 18th St., Harrisburg, Pa.

Italian Macro Lepidoptera.—Perfect spread specimens accurately determined are offered in exchange for North American Macro Lepidoptera.—Giacinto Gianelli, Rivoli, Tornise, Italy.

Wanted.—*Elateridae* and *Buprestidae* from all parts of North America. Will give in exchange named Coleoptera and Lepidoptera (diurnals, in papers).—C. O. Houghton, Delaware College, Newark, Delaware.

Wanted for Cash.—Insect Life, Vol. ii, Nos. 2, 5, 11, 12; Vol. iii, Nos. 11, 12. Psyche, Vol. xii, No. 2. Fntomological News, Vol. xv, No. 4. State price.—Wm. S. Marshall, 116 E. Gorham Street, Madison, Wis.

I have for exchange cocoons and pupae of *tityrus*, *D. myron*, *A. actomaculata*, *P. sexta*, *Ph. achemon*. Wish to exchange with collectors from California, Arizona and New Mexico. Also material from Europe and other duplicates. "Skeemers are not wanted."—J. N. Lang, 104 Bunker St., Chicago, Ill.

I am looking for extra large expanse Lepidoptera, especially Saturnians and Sphinges. Let me know expanse and price.—C. V. Blackburn, Stoneham, Mass., U. S. A.

All kinds of Moths and Butterflies to exchange for American species not in my collection. Sent lists to Joseph H. Reading, 775 N. Rockwell St., Chicago, Ill.

For exchange—Geological and duplicate entomological publications for other literature treating of insects. Lists furnished.—E. S. Tucker, Box 208, Dallas, Texas.

I have *Parn. apollo*, *delius*, *mnemosye*, *Arg. aglaia*, *adippe*, *lathonia*, *Sat. circe*, *hermione*, *alliona*, *Apatura ilia*, *clytie*, *Lim. populi*, Indian exotics, rarest Eupitheciae (bred). Wanted cocoons *cecropia*, *angulifera*, etc., *asterias*, *ajax*, *zolicaon*, etc. Catocalae eggs.—J. W. H. Harrison, 181 Abingdon Rd., Middlesbro', England.

Wanted—Pupae of Papilios, Argynnis, etc., also of certain Sphinges, in exchange for specimens in papers.—C. H. Bode, 2005 Carson Street, Pittsburg, Pa.

I have for exchange cocoons of *T. polyphemus*, pupae of *Od. carmelita*, *Bist. strataria* and *Selenia tetralunaria*. Send exchange list.—J. J. Henneberger, 10114 Ewing Ave., Chicago, Ills.

Wanted.—Entomological News, Vol. X, No. 10.—G. W. J. Angell, 235 W. 76th St., New York.

Lepidoptera Wanted.—*Argynnis diana*, male and female, by purchase or exchange.—H. S. Gladwin, Madison, New Jersey.

I want Riley's Ninth Missouri Report. Will pay cash or exchange, literature or Lepidoptera I also desire to correspond with collectors possessing "freak" Lepidoptera with purpose of photographing same for study.—H. H. Newcomb, 43 Tremont St., Boston, Mass.

I wish to exchange the Hemiptera of the world, Heteroptera and Homoptera, and will give in return species from Hungary correctly named.—Robert Meusel, Janospuszta bei Szokolya Hont-megye, Ungarn.

For exchange.—Rare Lepidoptera and Coleoptera from Arizona for Entomological Literature.—V. W. Owen, Clerk's Office, U. S. Courts, Los Angeles, Cal.

I collect in all orders for cash. Price lists Coleoptera, Hemiptera, Hymenoptera for 2c. stamp. Positively no exchange.—A. H. Manee, Southern Pines, N. C.

Am back on the farm again and would be pleased to collect insects in any order in exchange for Coleoptera and Hemiptera, for my collection, or literature on these orders. Meloidae, Coccinellidae and Membracidae especially wanted.—W. E. Snyder, Beaver Dam, Wisconsin.

Wanted for cash, named or unnamed material in the Trogositidae of United States, Canada and northern Mexico. Dates desirable. Locality must be guaranteed. Information regarding life habits appreciated. Write, stating particulars and prices.—R. P. Dow, 15 Broad Street, New York City.

Lepidoptera—I have for exchange bred specimen of *D. portlandia*, *A. andria*, *E. deflorata*, *P. ajax* and others.—Chas. L. Heink, 4320 N. 11th St., St. Louis, Mo.

I desire to exchange with collectors of Lepidoptera in Florida, Ariz. and Nevada, also South America, India and Japan. Send lists to A. F. Porter, Decorah, Iowa, U. S. A.

Following bred Catocalae—I hope in coming season give in exchange *fraxini*, *sponsa*, *nupta*, *elocata*, *electa*, *dilecta*, *conjuncta*, *promissa*, *puerpera*. *pacta*, *optata*, *fulminea*, *conversa*, *nymphagoga*. Would like American Catocalae only, the same first-class quality.—G. Eberhard, Berlin Friedenau, Beckerstr. i. Germany.

Lindsay Symington, of Looe, Cornwall, England, wishes to correspond with collectors in South and Central America; also California and other western parts of North America, with the object of friendly exchanges of papered Lepidoptera.

Fine Moths, live cocoons, butterflies, leaf insects, walking sticks, beetles, etc., from Assam, Darjeeling, Ceylon and Andaman Is., also bird's eggs (central blown), and orchids can be had from A. Meik, 4 Convent Road, Entally, Calcutta.

Exchange—I have for exchange the following specimens from the Canadian Northwest: *Argynnis lais*, *P. ismeria*, *M. harrisii*, *S. nephele*, var. *olympus*, *L. afra*, *L. rustica*, *L. Saepiolus*.—Wanted other Rhopalocera in return.—A. R. M. Boulton, 5 Morrin Court, Quebec, Canada.

RARE BOOKS FOR SALE.

"Say's Entomology," LeConte edition, two vols., 1859. $18.00.

"Proceedings of the Entomological Society of Philadelphia," six vols., three full sets, $50.00 each.

"Edward's Butterflies of North America," three vols., $125.00.

Large stock of rare books for sale—send for list.

R. C. AUXER, 150 South Prince Street, Lancaster, Penna.

FOR SALE

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